HP StorageWorks TapeAssure LTFS Service Version 1.0 User Guide

This document provides information about the HP StorageWorks TapeAssure LTFS service, which makes it possible to monitor the health and status of your standalone Ultrium tape drives. This guide is intended for storage and system administrators who monitor and manage tape devices in HP LTFS installations.

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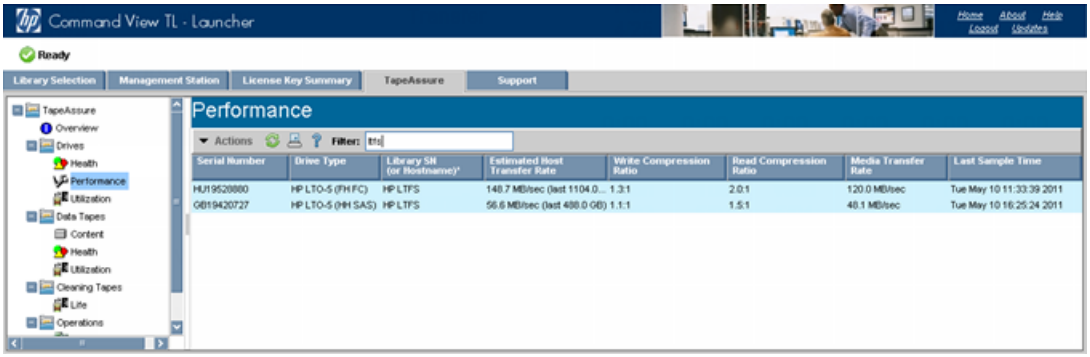
1 Introduction

This guide provides information about the TapeAssure service monitoring software for LTFS installations. The TapeAssure service makes previously unavailable information about the health and use of standalone HP Ultrium tape drives available through the HP TapeAssure dashboard in Command View for Tape Libraries (Command View TL).



Features

HP StorageWorks TapeAssure service collects operational data for the standalone tape drives and tapes being monitored. The data is sent to and stored in the Command View TL database and can be viewed using the Command View TL GUI through a health, performance, and utilization dashboard that includes the following components:

- Drive Health — write/read quality levels, key drive life indicators, and any service actions.
- Drive Performance — host and media transfer rates and compression ratios.
- Drive Utilization – the time the drive is in use as a percentage.
- Tape Health – effective capacity, key tape life indicators and any service actions. Effective capacity is a key measure of the health of the drive and tape combination. The data is always written at high quality, but using more tape to write the data if there are write issues, making effective capacity a better measure of tape health than raw error rate.
- Tape Utilization – write and read data volumes and capacity used.

Detailed information about each specific drive and tape is available from its properties page, which is accessed by double-clicking the appropriate row on the dashboard.

Benefits

The information provided by HP TapeAssure enables you to:

- Make the best use of your equipment, including the ability to:
  - Know the usage levels of each drive and whether the drives are kept streaming
  - Know which tapes are being used and how much capacity remains
  - Measure performance and utilization so you can tune the configuration of your systems to make best use of your investment

- Reduce total cost of ownership (TCO) through better utilization and reduced need for unused capacity
- Justify capacity increases with real data about usage.

- Maintain equipment with minimum disruption by:
  - Knowing the remaining expected life of drives and tapes, and planning ahead for possible maintenance and replacement.
  - Finding out the health of drives and tapes, and about issues before hard failures occur.
  - Receiving proactive advice on corrective actions.
  - Finding out about the quality of backup data and its viability for long term storage. Receive timely warnings and take pre-emptive action for any real issues.
  - Reduce total cost of ownership through reduced downtime and disruption

Although these are normally considered enterprise features, they apply equally to all applications of tape based backup and are therefore available with all HP LTO-based devices, from standalone drives to enterprise class libraries.

Architecture

TapeAssure incorporates HP's industry-leading diagnostic tool, L&TT, into the data collection solution. The LTFS driver pulls an L&TT support ticket from the drive whenever a cartridge is unmounted and uses the TapeAssure LTFS service to send it to CommandView TL. Within Command View TL another form of L&TT runs a full diagnostic analysis on the tape drive, tape, and data.

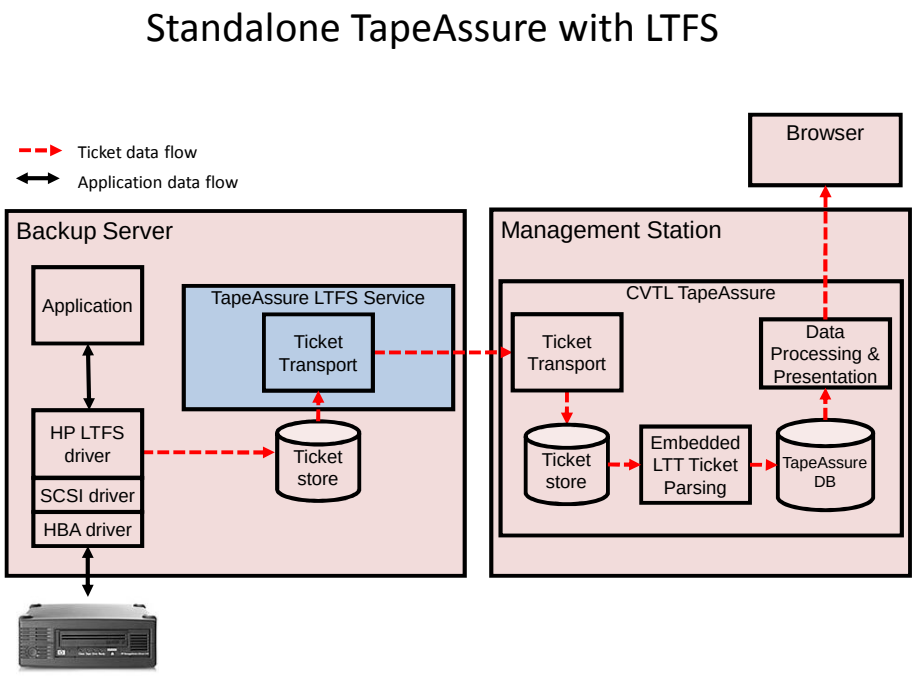


Figure 1 TapeAssure architecture for standalone tape drives

The TapeAssure service for LTFS runs as a deamon process, which can be started and stopped using the TapeAssure LTFS service management tool provided with the package.

Supported configurations

The TapeAssure service supports:

- The same LTO tape devices and host bus adaptors (HBAs) supported by HP LTFS
- Operating systems:
  - Redhat 5 Linux 32
  - Redhat 5 Linux 64
  - Redhat 6.0 Linux 32
  - Redhat 6.0 Linux 64
  - SuSE ES11 Linux 32
  - SuSE ES11 Linux 64
  - MAC OS x 10.5
  - MAC OS x 10.6
- Supporting applications
  - HP LTFS Standalone 1.2 or later
- Command View TL version 2.6 or later

NOTE:

Command View TL is only supported on Windows, requiring a mixed installation of Linux/MAC and Windows servers for TapeAssure support. The Windows server can be any server accessible via the LAN from the server running HP LTFS (firewalls permitting).

Typical configurations

TapeAssure is very flexible in the configurations it can support. HP recommends using a single Command View TL management station to consolidate the data.

HP TapeAssure supports the following configurations:

- Single server, single tape drive

  This is a very common configuration. In this case, the TapeAssure service should be installed on the server. Command View TL can be installed anywhere that the TapeAssure service can access across your company intranet - including the backup server itself.
- Single server, multiple tape drives

  This is similar to the single drive configuration. The TapeAssure service monitors all the drives on the server.
- Multiple servers, multiple tape drives

  This is a common configuration for larger businesses and often applies to businesses with multiple sites. In this case the TapeAssure service should still be installed on each of the backup servers, but Command View TL should be installed on a server best placed for centralized monitoring. This can be anywhere on the intranet. This is an ideal use for TapeAssure where backups are automated in many locations and monitored from a central location.

Comparing TapeAssure and L&TT

The two tools work together to provide a full monitoring and diagnostic solution, and are fully compatible and consistent. For example, a support ticket pulled as part of monitoring activity can be opened and viewed using L&TT, allowing you to see all support ticket information. TapeAssure focuses on the key pieces of data in a support ticket and is therefore a subset of the complete L&TT functionality.

The two tools are complementary and are focused on different use models:

- TapeAssure is a monitoring solution.

  It is part of the configuration and always on. All analysis is passive, based on the rich detail in each support ticket, which is automatically pulled at the end of each backup. Analysis results reflect the real life use of the system. There are no active tests carried out in a test environment, so if potentially serious issues are identified, TapeAssure will recommend the use of L&TT to run the Drive Assessment test.

- L&TT is a standalone application that runs on the backup server.

  The tool is usually run after encountering an issue or if you want to check the health of your system. It offers three main capabilities, as well as other utilities:

  - Firmware update
  - Support ticket acquisition and analysis – as per TapeAssure
  - Active tests – the most important of which is the Drive Assessment test.

2 Installation and configuration

NOTE:

These instructions assume that HP LTFS is already installed on the server. For instructions on installing HP LTFS see the HP LTFS user guide available at http://www.hp.com/go/ltfs.

Using TapeAssure with drives connected to a computer running a Linux or Mac operating system and managed by HP LTFS requires installation of two components — the TapeAssure LTFS service and Command View TL.

- Command View TL receives, stores, and analyzes the tickets, and then displays the results through its browser-based user interface.

Downloading, installing, and starting the TapeAssure LTFS service

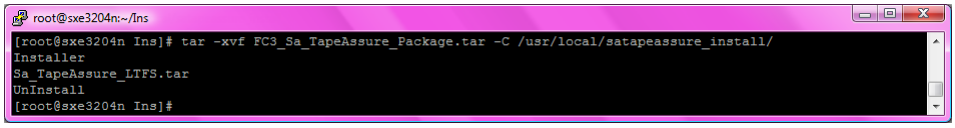
NOTE:

You must be logged in as root to install the TapeAssure LTFS service.

To download, install, and start the TapeAssure LTFS service:

1. Download the TapeAssure LTFS service from www.hp.com/go/tapeassure.
   a. Navigate to the correct download for the required operating system.
   b. Download the install package.
2. Extract the installation file from the `Sa_TapeAssure_Package` tar file package. For example,

   ```
   tar -xvf <Package tar file name> <Destination directory>
   ```

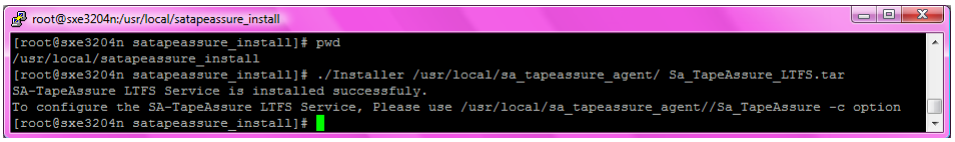
   

3. Change directory to the directory of the extracted files. For example:

   ```
   cd /usr/local/satapeassure_install
   ```

4. Execute the Installer script. For example,

```
./Installer <Install directory> <Extracted tar file>
```


root@sxe3204n:/usr/local/satapeassure_install
[root@sxe3204n satapeassure_install]# pwd
/usr/local/satapeassure_install
[root@sxe3204n satapeassure_install]# ./Installer /usr/local/sa_tapeassure_agent/ Sa_TapeAssure_LTFS.tar
SA-TapeAssure LTFS Service is installed successfuly.
To configure the SA-TapeAssure LTFS Service, Please use /usr/local/sa_tapeassure_agent//Sa_TapeAssure -c option
[root@sxe3204n satapeassure_install]#

NOTE:

Ensure that permissions on the install directory allow writing files.

5. Change directory to the location of the extracted files. For example:

```
cd /usr/local/sa_tapeassure_agent
```

6. Configure the service by executing the `Sa_TapeAssure` utility in the install directory using the `-c` option. At the prompt, enter the configuration parameters:

   a. IP address of the Command View TL management station.

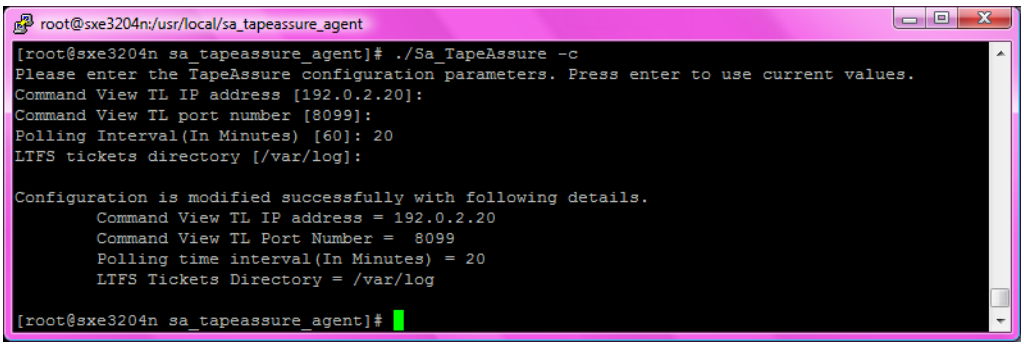
   b. Port number of the Command View TL management station.

   c. Polling interval, in minutes, to check for tickets. The default is 60 minutes.

   d. HP LTFS ticket store directory. Default is `/var/logs/`.

   A blank entry leaves the configuration value unchanged.

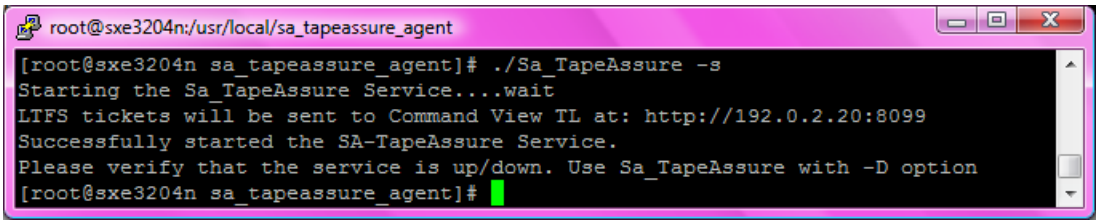
   For example:


root@sxe3204n:/usr/local/sa_tapeassure_agent
[root@sxe3204n sa_tapeassure_agent]# ./Sa_TapeAssure -c
Please enter the TapeAssure configuration parameters. Press enter to use current values.
Command View TL IP address [192.0.2.20]:
Command View TL port number [8099]:
Polling Interval(In Minutes) [60]: 20
LTFS tickets directory [/var/log]:
Configuration is modified successfully with following details.
Command View TL IP address = 192.0.2.20
Command View TL Port Number = 8099
Polling time interval(In Minutes) = 20
LTFS Tickets Directory = /var/log
[root@sxe3204n sa_tapeassure_agent]#

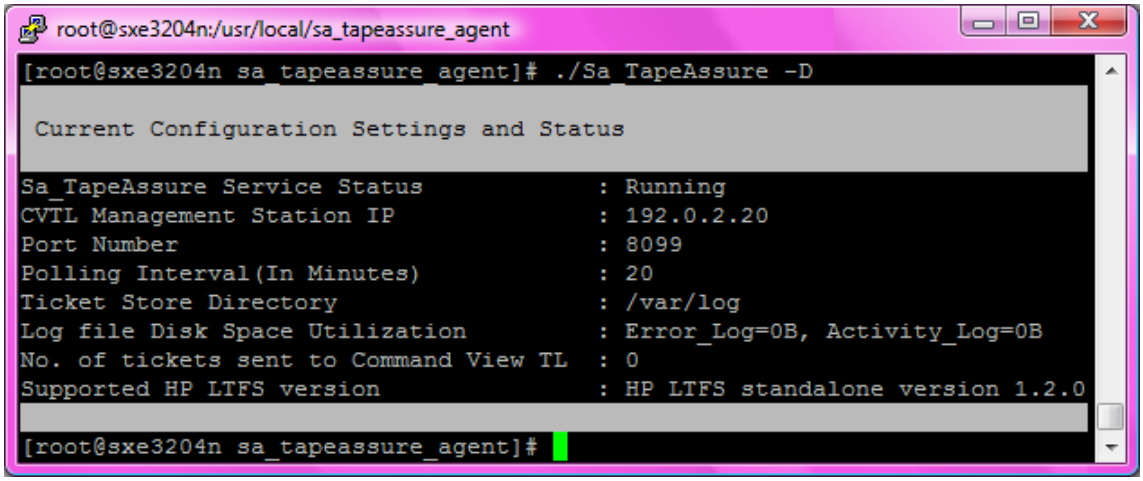
NOTE:

If Command View TL is not operating, the tickets will be stored on the server, ready to be sent to Command View TL when it is available.

7. Start the service using the `Sa_TapeAssure` utility with the `-s` option.


root@sxe3204n:/usr/local/sa_tapeassure_agent
[root@sxe3204n sa_tapeassure_agent]# ./Sa_TapeAssure -s
Starting the Sa_TapeAssure Service....wait
LTFS tickets will be sent to Command View TL at: http://192.0.2.20:8099
Successfully started the SA-TapeAssure Service.
Please verify that the service is up/down. Use Sa_TapeAssure with -D option
[root@sxe3204n sa_tapeassure_agent]#

8. Verify that the service is running by executing Sa_TapeAssure with the -D option.


root@sxe3204n:/usr/local/sa_tapeassure_agent
[root@sxe3204n sa_tapeassure_agent]# ./Sa_TapeAssure -D
Current Configuration Settings and Status
Sa_TapeAssure Service Status : Running
CVTL Management Station IP : 192.0.2.20
Port Number : 8099
Polling Interval(In Minutes) : 20
Ticket Store Directory : /var/log
Log file Disk Space Utilization : Error_Log=0B, Activity_Log=0B
No. of tickets sent to Command View TL : 0
Supported HP LTFS version : HP LTFS standalone version 1.2.0
[root@sxe3204n sa_tapeassure_agent]#

Downloading and installing Command View TL

The installation of Command View TL is covered fully in the *HP StorageWorks Interface Manager and Command View TL user guide*, available from: http://www.hp.com/support/cvtl. Command View TL is an enterprise library-focused, web-based application, and the use with HP TapeAssure is for only a subset of its full capabilities.

Reporting errors and logs

The TapeAssure LTFS service provides the following output files, as well as STDOUT. Two files are located under `logs` in the install directory and can be viewed with any text editor:

- SA-TapeAssure_Service_error — for errors encountered during operation
- SA-TapeAssure_Service_log — for logging TapeAssure LTFS service activity

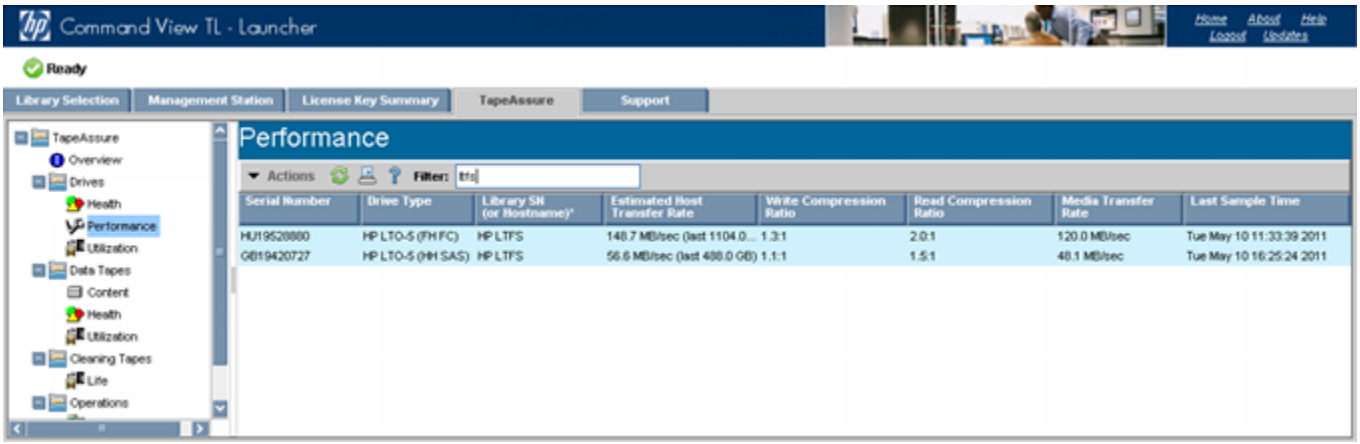
Verifying the installation

HP TapeAssure LTFS service requires the `SA_TapeAssure_Service` daemon to be running. To verify that the service is running:

- Execute `Sa_TapeAssure -d` and verify that the status is `RUNNING`.

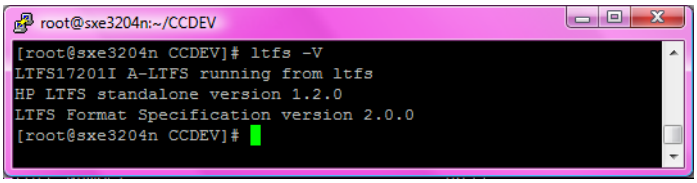
The simplest way to verify that the service is running and tickets are getting to Command View TL is to perform a normal write and unmount sequence and use the Command View TL user interface to verify that the data has been received:

1. Mount a tape using HP LTFS.
2. Write data to that tape.
3. Unmount the tape.
4. Wait for the service polling interval, which is 60 minutes by default. Alternatively you can stop and re-start the TapeAssure service.
5. Click on the Command View TL TapeAssure Drives **Performance** tab and verify that the drive serial number appears in the list.

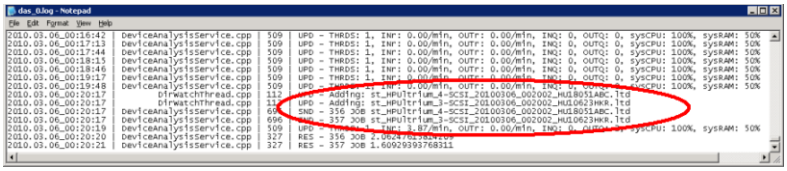


To verify each step of the process:

1. Verify that the HP LTFS driver is installed correctly and running.



2. Verify that the following directories are in the install directory:
   - `configuration`
   - `logs`
   - `utils`
3. Verify that the TapeAssure LTFS service is running. Use the `Sa_TapeAssure` utility with the `-d` option and verify that the status is `Running`.
4. Verify that the tickets are being received by Command View TL (even if the drives are not shown in the user interface) by checking for the ticket in the Command View TL `das_0.log` file.
   a. On the server running CommandView TL, open the file `C:\Program Files\Hewlett-Packard\Command View TL\log\das_0.log` in a text editor, such as Notepad.
   b. Look for an entry showing that the ticket was received.



NOTE:

For a full set of installation checks, see Chapter 5, page 27.

About using Command View TL with the TapeAssure service

Command View TL is a web-based application that usually runs on a separate server than the backup server. Your organization might already have an installation of Command View TL for existing HP EML or ESL-e libraries. If so, this can be used for the TapeAssure service, provided it is running the latest firmware.

NOTE:

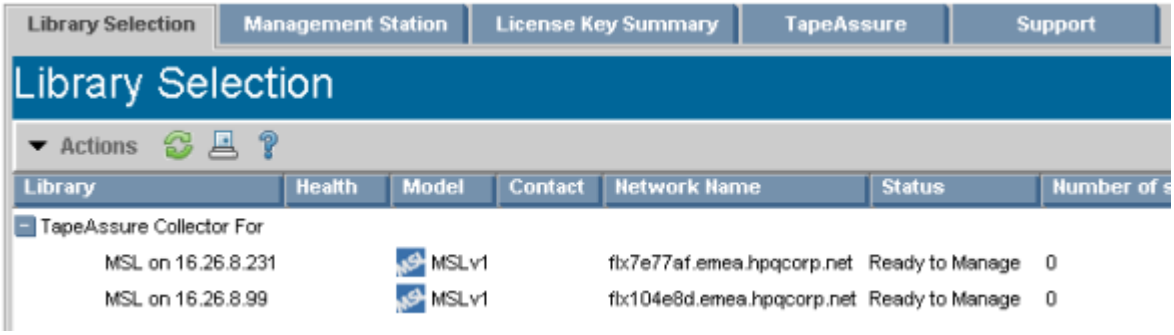
HP recommends using a single Command View TL management station for all TapeAssure-monitored systems.

Command View TL is a large, Java-based application and can take up to five minutes to initialize and launch.

Using HP TapeAssure in Command View TL does not require a license. The Command View TL license covers advanced library features which are not related to TapeAssure functionality

About the Command View TL Library Selection screen

When Command View TL starts, it displays the **Library Selection** screen, which displays information about libraries.

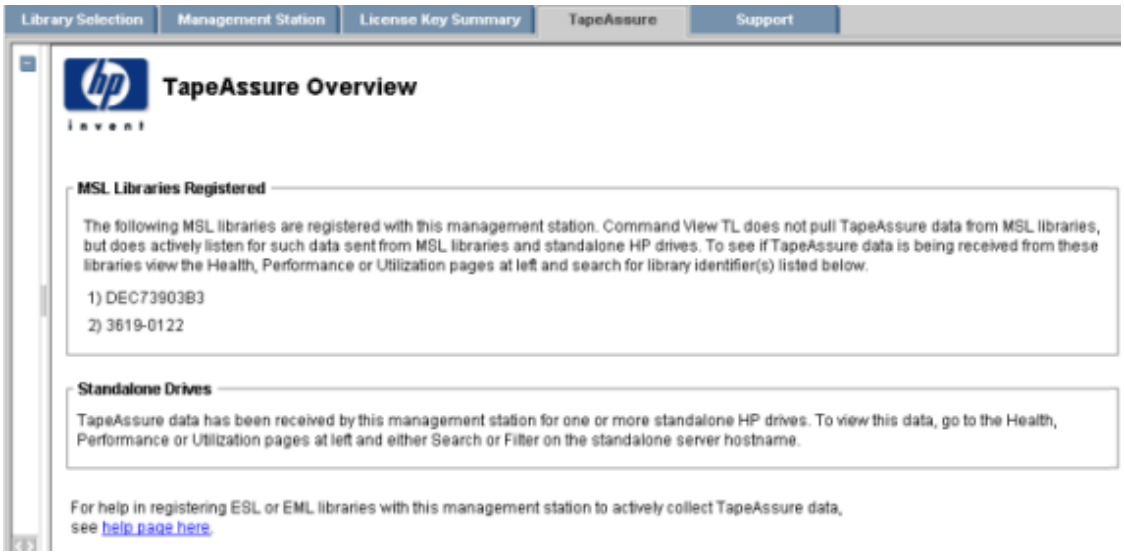


Click the **TapeAssure** tab to view the TapeAssure data.

If the installation is only for the use of the TapeAssure service, the other tabs can be ignored; they are provided for library-specific features.

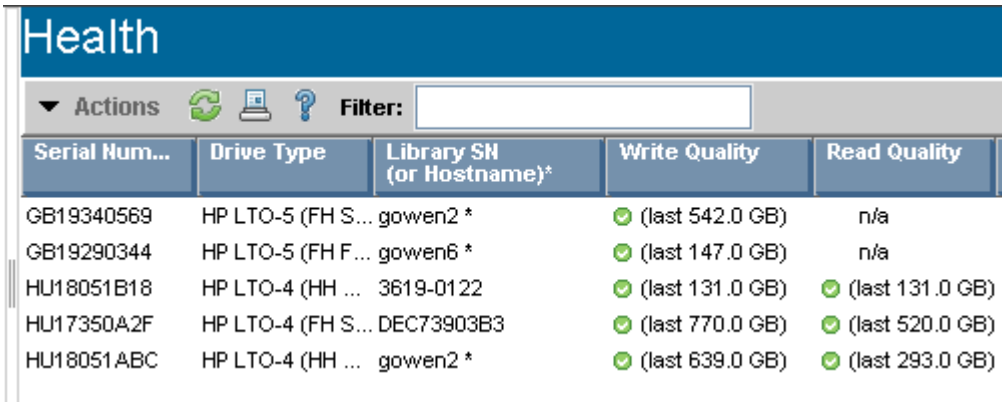
TapeAssure overview

The first item displayed in the **TapeAssure** tab is the **TapeAssure Overview**. This overview lists the systems monitored by HP TapeAssure. If there is data about standalone tape drives in the database, then this is also referenced.


Library Selection
Management Station
License Key Summary
TapeAssure
Support
TapeAssure Overview
MSL Libraries Registered
The following MSL libraries are registered with this management station. Command View TL does not pull TapeAssure data from MSL libraries, but does actively listen for such data sent from MSL libraries and standalone HP drives. To see if TapeAssure data is being received from these libraries view the Health, Performance or Utilization pages at left and search for library identifier(s) listed below.
1) DEC73903B3
2) 3619-0122
Standalone Drives
TapeAssure data has been received by this management station for one or more standalone HP drives. To view this data, go to the Health, Performance or Utilization pages at left and either Search or Filter on the standalone server hostname.
For help in registering ESL or EML libraries with this management station to actively collect TapeAssure data, see help page here.

Library and serial number information

The TapeAssure data contains references to library serial numbers or host names. For tape drives managed under HP LTFS, this column shows the string `HP LTFS`.


Health
Actions
Filter:
Serial Num...
Drive Type
Library SN (or Hostname)*
Write Quality
Read Quality
GB19340569 HP LTO-5 (FH S... gowen2 * (last 542.0 GB) n/a
GB19290344 HP LTO-5 (FH F... gowen6 * (last 147.0 GB) n/a
HU18051B18 HP LTO-4 (HH ... 3619-0122 (last 131.0 GB) (last 131.0 GB)
HU17350A2F HP LTO-4 (FH S... DEC73903B3 (last 770.0 GB) (last 520.0 GB)
HU18051ABC HP LTO-4 (HH ... gowen2 * (last 639.0 GB) (last 293.0 GB)

About the operation of the TapeAssure LTFS service

The TapeAssure LTFS service is implemented as a daemon that can be started and stopped using the Sa_TapeAssure utility under the installation directory. TapeAssure transports tickets to Command View TL that are pulled by HP LTFS when a tape is unmounted.

The TapeAssure LTFS service is configured to check for available tickets at 60 minute intervals by default. You can change this configuration to match the unmount frequency. Processing overhead is very low so extending the check interval is not necessary for performance reasons.

It is important that the tape is not unloaded manually because it will confuse the LTFS driver and not result in a pulled ticket. LTFS will normally set `Prevent Media Removal` to ensure this doesn't happen but power cycles and `force eject` can still override this. Only an LTFS-controlled unmount will result in a ticket that can be sent to Command View TL.

Some of the calculations from the tickets are estimates, so writing more data between unmounts results in more accurate TapeAssure data. For this reason, some TapeAssure calculations will only be performed when at least 4 GB has been written between unmounts.

The assumed time of the pulled ticket is based on when it is received by Command View TL. This avoids inconsistency with time zones and incorrectly set clocks. In normal operation this works well because tickets are received within an hour of being pulled (based on the transport interval configuration) but if the connection to Command View TL is lost for a period of time and then recovered, the tickets waiting to be sent will all be received at the same time. These tickets will then have very similar time stamps, causing an unexpected increased in calculated utilization for that time period.

3 Using TapeAssure

Conducting a health assessment of drives and tapes

Unless L&TT has been used regularly, this may be the first health assessment that has been performed on the tape drive, which might trigger warnings and indicate service actions.

NOTE:

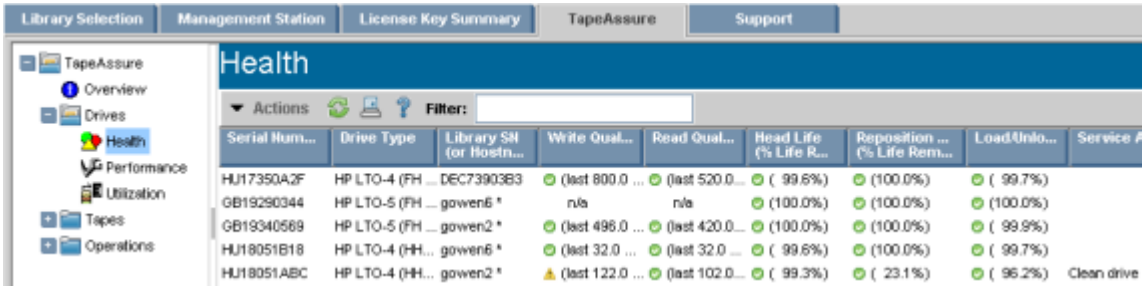
You should be prepared to address possible warnings and/or service actions, such as clean drive or retire tape the first time you use HP TapeAssure.

Following the first backup, Command View TL will display TapeAssure health data for the drive and tape. To view the data:

1. In Command View TL, click the **TapeAssure** tab.

2. Select **Drives > Health** from the navigation pane.

   HP TapeAssure displays a summary of all drive health information in the right hand pane.


Library Selection
Management Station
License Key Summary
TapeAssure
Support
TapeAssure
Overview
Drives
Health
Performance
Utilization
Tapes
Operations
Health
Actions
Filter:
Serial Num...
Drive Type
Library SN (or Hostn...
Write Qual...
Read Qual...
Head Life (% Life R...
Reposition ... (% Life Rem...
Load/Unlo...
Service A
HU17350A2F HP LTO-4 (FH ... DEC73903B3 (last 800.0 ... (last 520.0... (99.6%) (100.0%) (99.7%)
GB19290344 HP LTO-5 (FH ... gowen6 * n/a n/a (100.0%) (100.0%) (100.0%)
GB19340569 HP LTO-5 (FH ... gowen2 * (last 496.0 ... (last 420.0... (100.0%) (100.0%) (99.9%)
HU18051B18 HP LTO-4 (HH... gowen6 * (last 32.0 ... (last 32.0 ... (99.6%) (100.0%) (99.7%)
HU18051ABC HP LTO-4 (HH... gowen2 * (last 122.0 ... (last 102.0... (99.3%) (23.1%) (96.2%) Clean drive

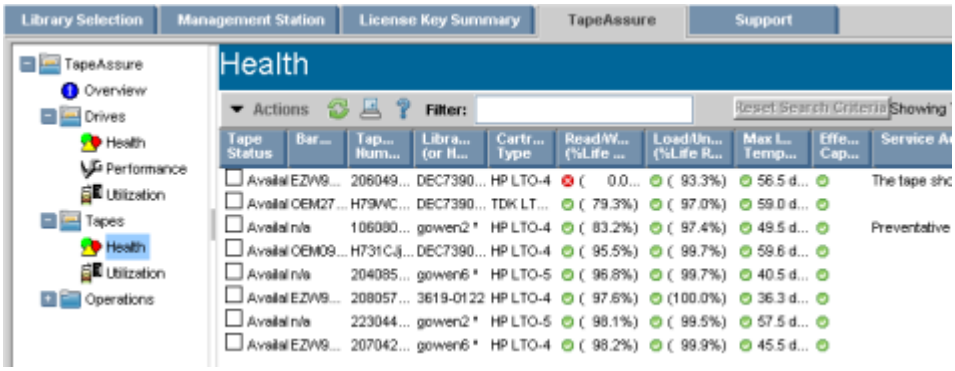
   The types of drive health information displayed in the TapeAssure tab are:

   - Write quality — displays how well the drive writes data to the tape. Note that data is always written at high quality (unless the drive returns an error), but it may take more tape to do so if there is an error rate problem. The system displays the amount of data written since the tape was last loaded.
   - Read quality — displays how well the drive is able to read the data from the tape. This takes account of error correction statistics and any required retries. The system displays the amount of data read since the tape was last loaded.
   - Head life — indicates the expected life remaining for the drive head, shown as a percentage of the expected drive head life based on HP recommended environmental conditions and usage. This measure is based on the amount of tape that has passed over the head over the lifetime of the drive.
   - Reposition life — indicates the expected life remaining of the tape path mechanics, shown as a percentage of the expected life based on the number of repositions that have occurred, assuming HP recommended environmental conditions and usage. Lower reposition life is only likely to be an issue if the host transfer rates are very slow and the drive is not streaming.
   - Load/unload life — displays the expected life remaining of the load/unload mechanics, shown as a percentage of the expected life, based on the number of load/unload cycles that have occurred, assuming HP recommended environmental conditions and usage.
   - Service action — If any issues or potential issues that have been identified, a service action will be listed in the Service Action field. Multiple service actions will be concatenated, if necessary. You can hover your mouse over the field to see the full explanation.

NOTE:

See the *HP StorageWorks Interface Manager and Command View TL user guide* for a complete explanation of the columns.

3. To view tape health data from the TapeAssure tab, select **Tapes > Health** from the navigation pane.



The types of drive health information displayed in the TapeAssure tab are:

- Read/write life remaining — the expected read/write life remaining of the tape, shown as a percentage of the expected life, assuming HP recommended environmental conditions and usage. This is based on the amount of tape that has passed over the drive heads, and compared with HP recommended tape usage limits. If the read/write life reaches 0%, the tape should be retired.

NOTE:

Note that this is independent of the quality of the data written. HP recommends that you not over-use your tapes.

- Load/unload life remaining — the expected load/unload life remaining of the tape shown as a percentage of the expected life, based on HP recommended environmental conditions and usage. This is based on the load/unload count of the tape and compared with HP recommended tape usage limits. If the load/unload life reaches 0%, the tape should be retired.
- Max internal temperature — the maximum internal drive temperature at which the tape has been written. Data quality can be jeopardized if the drive is too hot, so this is an important measure. Note that the temperature shown is internal and can get very hot before you receive any warnings. Use the traffic light symbol to gauge if there are any concerns. A service action will also be issued if there are any actions to take.
- Effective capacity — the effective capacity of the tape, based on the amount of tape being used to write data. The drives always write high quality data (unless they return an error) but will take more tape to do so if there are error rate issues. The effective capacity will be reduced if a drive is using too much tape. This is a traffic light-only column with service actions issued if any follow up is needed.
- Service action — If any issues, or potential issues with the above fields have been identified, then a service action will be listed here. Multiple service actions will be concatenated if necessary. Hover your mouse over the field to see the full explanation.

NOTE:

See the *HP StorageWorks Interface Manager and Command View TL user guide* for a complete explanation of the columns

Once you complete the service actions, you can be confident that your drives, tapes and, most importantly, your backup data are in good health.

NOTE:

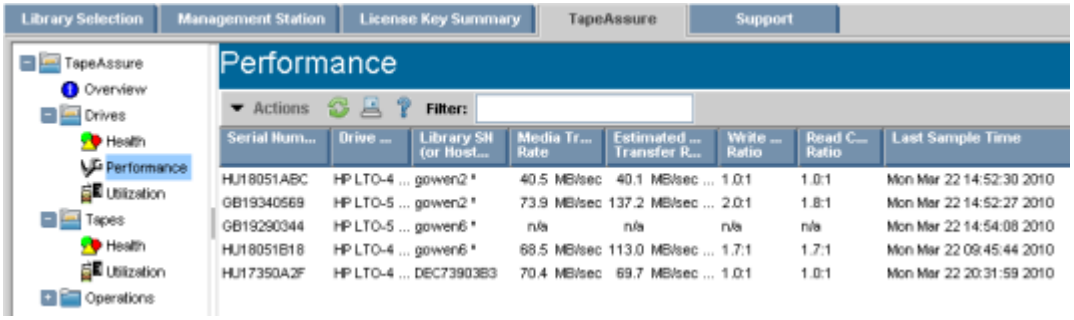
You can obtain additional help by hovering your mouse cursor over the appropriate field and/or clicking on **Help**.

Conducting a performance assessment of drives

Conducting a performance assessment of tape drive is important because:

- HP's Ultrium tape drives are extremely fast, and if you utilize them at the fastest transfer rates, backup windows will be shorter, making better use of the equipment.
- If the drives are not kept streaming, drive life may be limited by reposition life. This could result in premature drive retirement.

1. Once the first backup is complete, HP TapeAssure generates performance data to view. Select **Drives -> Performance** from the **Navigation** pane.


Library Selection
Management Station
License Key Summary
TapeAssure
Support
TapeAssure
Overview
Drives
Health
Performance
Utilization
Tapes
Health
Utilization
Operations
Performance
Actions
Filter:
Serial Num...
Drive ...
Library SN (or Host...
Media Tr... Rate
Estimated ... Transfer R...
Write ... Ratio
Read C... Ratio
Last Sample Time
HU18051ABC HP LTO-4 ... gowen2 * 40.5 MB/sec 40.1 MB/sec ... 1.0:1 1.0:1 Mon Mar 22 14:52:30 2010
GB19340569 HP LTO-5 ... gowen2 * 73.9 MB/sec 137.2 MB/sec ... 2.0:1 1.8:1 Mon Mar 22 14:52:27 2010
GB19290344 HP LTO-5 ... gowen6 * n/a n/a n/a n/a Mon Mar 22 14:54:08 2010
HU18051B18 HP LTO-4 ... gowen6 * 68.5 MB/sec 113.0 MB/sec ... 1.7:1 1.7:1 Mon Mar 22 09:45:44 2010
HU17350A2F HP LTO-4 ... DEC73903B3 70.4 MB/sec 69.7 MB/sec ... 1.0:1 1.0:1 Mon Mar 22 20:31:59 2010

2. Check the **Media Transfer** rate.

   Also known as the *native* transfer rate, this is the rate at which the drive writes data to the tape after compression. If the drives are being used at their maximum speed, then this rate will line up with the native speed specifications for the drive. If the drive is not operating at its maximum media transfer rate, then there is a potential opportunity to make better use of the drive's performance.

3. Check the **Estimated Host Transfer Rate** to see what data rate the drive is experiencing from the host.

   This is the media transfer rate multiplied by the compression ratio, but it is useful to know the data rate from the host point of view. This is the actual data rate of the data being received from the host to the drive and is the rate most under your control.

4. If these data rates are lower than expected, the data from this screen give you the evidence needed to examine the data path between the source data and the host interface of the drive.

   There is nearly always a significant opportunity to make better use of the high data rates the tape drives can accept, though the solution is not necessarily straight forward. Bottlenecks could be caused by:

   - The source disks
   - The SAN
   - The host server
   - The host bus adaptors (HBAs), or other devices consuming bandwidth etc.

5. You can also use the data to see what compression ratios are being achieved.

   This is not something that can normally be changed, but it is useful to know how well the user data is actually compressing. This information is not usually available, yet has a significant impact on how much data can be written to a tape and the potential host data rates that can be accommodated. Note that the write and read compression ratios can be different if different data sets are used, such as when a full volume backup is followed by a partial read/verify.

Conducting a utilization assessment for drives

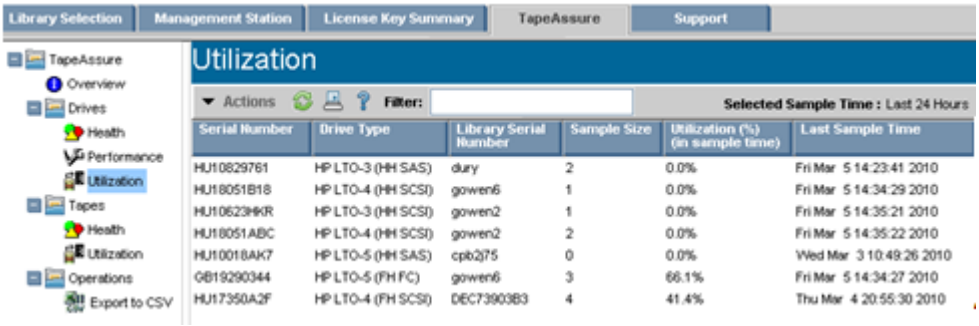
Once you measure how much your tape drives are used, you can make improvements.

1. Determine the sample period over which you want to measure utilization.

   Different jobs for backups, restores, archival or other needs will show different utilization behavior. Select a representative time period, such as a week, which covers a typical cycle, such as a full backup followed by a week of incremental backups.

2. To view drive utilization data from the **TapeAssure** tab, select **Drives > Utilization** from the navigation pane.

   Utilization appears under the column: **Utilization (%) (in sample time)**.


Library Selection
Management Station
License Key Summary
TapeAssure
Support
TapeAssure
Overview
Drives
Health
Performance
Utilization
Tapes
Health
Utilization
Operations
Export to CSV
Utilization
Actions
Filter:
Selected Sample Time : Last 24 Hours
Serial Number
Drive Type
Library Serial Number
Sample Size
Utilization (%) (in sample time)
Last Sample Time
HU10829761 HP LTO-3 (HH SAS) dury 2 0.0% Fri Mar 5 14:23:41 2010
HU18051B18 HP LTO-4 (HH SCSI) gowen6 1 0.0% Fri Mar 5 14:34:29 2010
HU10623HKR HP LTO-3 (HH SCSI) gowen2 1 0.0% Fri Mar 5 14:35:21 2010
HU18051ABC HP LTO-4 (HH SCSI) gowen2 2 0.0% Fri Mar 5 14:35:22 2010
HU10018AK7 HP LTO-5 (HH SAS) cpb2j75 0 0.0% Wed Mar 3 10:49:26 2010
GB19290344 HP LTO-5 (FH FC) gowen6 3 66.1% Fri Mar 5 14:34:27 2010
HU17350A2F HP LTO-4 (FH SCSI) DEC73903B3 4 41.4% Thu Mar 4 20:55:30 2010

3. To select the sample time, click on the **Actions** pull-down list.
4. Click **OK** and the Utilization data will be refreshed based on the new sample period. You can also see the following data about sampling:

   - The **Sample Size** column displays the number of unique tickets pulled during the sample period and the last sample time – the time of the last ticket. Note that a unique ticket is one with a unique tape load count.

   In this example, the sample time has been set to (a rolling window of) 24 hours and only the last two drives listed have been used during that time – but these have been used quite a bit. The first of these has been used 66.1%, which is approximately 16 hours over the last 24.

5. Depending on the utilization data, you should consider the following:

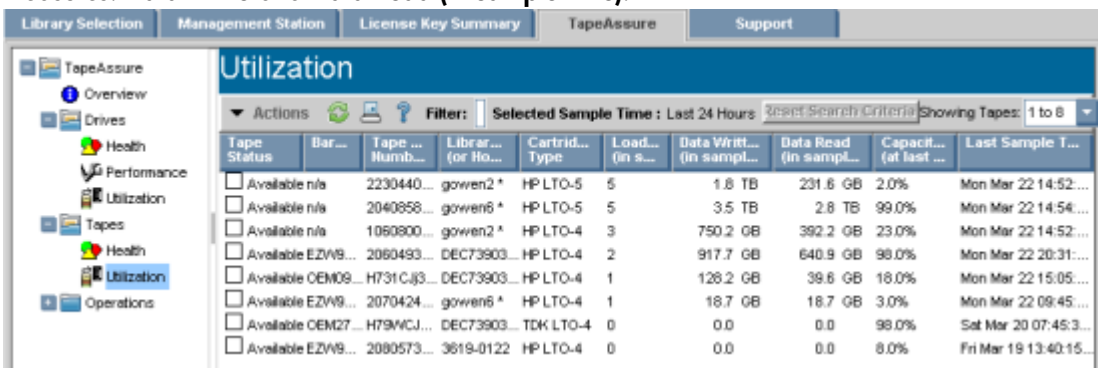
   - If drive utilization is generally lower than expected, the there is an opportunity to make better use of the drives. That may be achievable through, for example, different scheduling of backups.
   - If drive utilization is uneven, you can spread the load across all your drives, which is preferable for longer drive life.
   - If drive utilization is very high, that is also good to know. It shows that good use is being made of the equipment and it is also a potential warning that a capacity increase may be needed – along with the evidence needed to support that request.

Conducting a utilization assessment for tapes

Tape utilization is an assessment of the efficiency of tape use.

1. To view tape utilization data from the TapeAssure tab, select **Tapes > Utilization** from the navigation pane.

   Utilization is shown under the column: **Capacity used (at last sample)** along with two other measures: **Data Write** and **Data Read (in sample time)**.


Library Selection
Management Station
License Key Summary
TapeAssure
Support
TapeAssure
Overview
Drives
Health
Performance
Utilization
Tapes
Health
Utilization
Operations
Utilization
Actions
Filter:
Selected Sample Time : Last 24 Hours
Reset Search Criteria
Showing Tapes: 1 to 8
Tape Status
Bar...
Tape ... Numb...
Librar... (or Ho...
Cartrid... Type
Load... (in s...
Data Writt... (in sampl...
Data Read (in sampl...
Capacit... (at last ...
Last Sample T...
Available n/a 2230440... gowen2 * HP LTO-5 5 1.8 TB 231.6 GB 2.0% Mon Mar 22 14:52:...
Available n/a 2040858... gowen6 * HP LTO-5 5 3.5 TB 2.8 TB 99.0% Mon Mar 22 14:54:...
Available n/a 1060800... gowen2 * HP LTO-4 3 750.2 GB 392.2 GB 23.0% Mon Mar 22 14:52:...
Available EZW9... 2060493... DEC73903... HP LTO-4 2 917.7 GB 640.9 GB 98.0% Mon Mar 22 20:31:...
Available OEM09... H731CJJ3... DEC73903... HP LTO-4 1 128.2 GB 39.6 GB 18.0% Mon Mar 22 15:05:...
Available EZW9... 2070424... gowen6 * HP LTO-4 1 18.7 GB 18.7 GB 3.0% Mon Mar 22 09:45:...
Available OEM27... H79WCJ... DEC73903... TDK LTO-4 0 0.0 0.0 98.0% Sat Mar 20 07:45:3...
Available EZW9... 2080573... 3619-0122 HP LTO-4 0 0.0 0.0 8.0% Fri Mar 19 13:40:15...

2. Tape capacity used is shown as a percentage (different cartridge types have different absolute capacities) and is the capacity used at the time of the last sample.

   With all your tapes listed in a table, it is quick to compare across all your tapes. If capacity used is lower than expected, you may be able to adjust your backup jobs to make more efficient use of your tapes.

   - The **Data Written** and **Data Read** columns show how much data was written or read during the sample period, which shows how much use or re-use of the tapes were made in that period.

3. To change the sample time, click on the **Actions** pull-down list.
4. Select the desired sample time and click **OK**.

Conducting a utilization assessment

The overall figure for drive utilization is calculated by multiplying the performance achieved (as a percentage of the drive's maximum native rate) by the time based utilization. For example:

- An HP LTO-4 Ultrium 1840 has a maximum native media rate of 120 MB/s. If the actual native rate achieved is 30 MB/s, that is a performance achievement of 25%.
- If the time based utilization shows 20%, combining these together gives you an overall utilization of 20% x 25% = 5%. These are typical figures showing just how much potential extra utilization is available.

Note that assessing overall utilization is currently a manual process and not shown directly in the HP TapeAssure user interface.

About email alerts

Command View TL enables you to set up and receive email alerts about any performance or utilization data. For more information, see the *HP StorageWorks Interface Manager and Command View TL user guide*. Although not covered in this document, alerts are an extremely valuable part of TapeAssure because they provide *hands off* monitoring of your tape drives and tapes.

4 Uninstalling the TapeAssure LTFS service

Under the installation directory, locate and execute the `Uninstall` executable, giving the install directory as a parameter. For example:

```
./UnInstall /usr/local/sa_tapeassure_agent

Are you sure that you want to uninstall the Sa_TapeAssure product[y/n]:y
Uninstalling the Sa_TapeAssure product from install directory: /usr/local/sa_tapeassure_agent
Sa_TapeAssure uninstalled successfully
```

5 Troubleshooting the TapeAssure LTFS service

The TapeAssure service requires the following processes to be working:

- Ticket pulling via HP LTFS
- Sending tickets to Command View TL
- Receiving, accepting, and processing tickets into the Command View TL database
- Presenting the TapeAssure data via the Command View TL GUI

The following checks guide you through a full verification of these processes, enabling you to diagnose issues. HP recommends that you follow them in the order listed.

Check compatibility

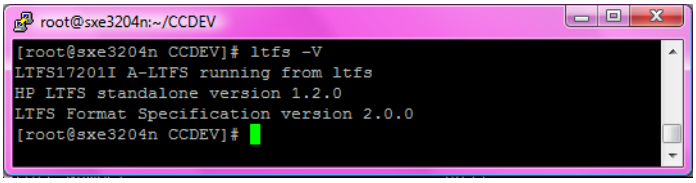
1. Verify that the installed version of HP LTFS is version 1.2 or higher.
2. Verify that the TapeAssure LTFS service is installed on the same server as HP LTFS.
3. Verify that the server (hardware and operating system) is supported by the TapeAssure LTFS service.
4. Verify that Command View TL is version 2.6 or later, and is installed on a supported server configuration.
5. Verify that the drives to be monitored are supported by HP LTFS.

NOTE:

There is no workaround for incompatible hardware.

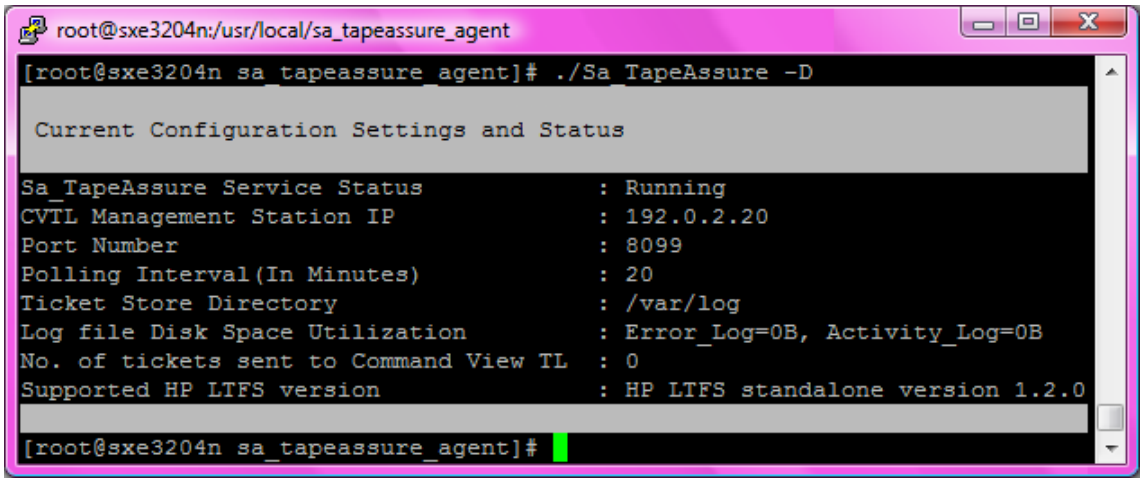
Check that HP LTFS is installed and running

Use `ltfs -V` to check the status of HP LTFS.



Check that the TapeAssure LTFS service is running

Use the SA_TapeAssure utility script to verify that the TapeAssure service is running. Execute `Sa_TapeAssure -d` and verify that the status is `Running`.


root@sxe3204n:/usr/local/sa_tapeassure_agent
[root@sxe3204n sa_tapeassure_agent]# ./Sa_TapeAssure -D
Current Configuration Settings and Status
Sa_TapeAssure Service Status : Running
CVTL Management Station IP : 192.0.2.20
Port Number : 8099
Polling Interval(In Minutes) : 20
Ticket Store Directory : /var/log
Log file Disk Space Utilization : Error_Log=0B, Activity_Log=0B
No. of tickets sent to Command View TL : 0
Supported HP LTFS version : HP LTFS standalone version 1.2.0
[root@sxe3204n sa_tapeassure_agent]#

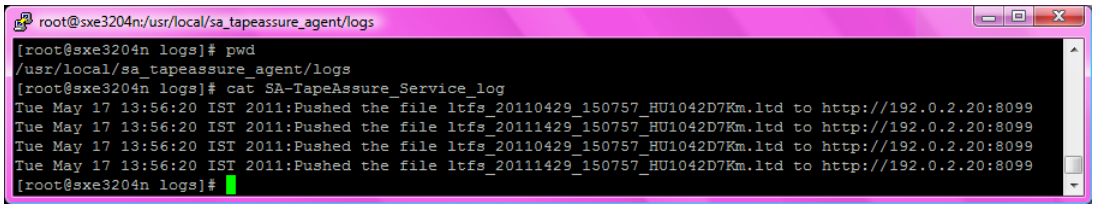
Check the configuration

Use the Sa_TapeAssure -d option to check the key configuration parameters:

- `CVTL Management Station IP` – Command View TL management station IP address
- `Port number` – Command View TL management station port number. Most likely this will be 8099, but it can be changed using Command View TL
- `Polling Interval` – verify that tickets are checked frequently enough to match your mount/unmount model. The installation default is that all outstanding tickets are pulled by the HP LTFS drive are sent every hour. Tickets are not removed from the HP LTFS ticket store directory after they are sent to Command View TL so they can still be viewed directly with L&TT.
- `Ticket Store Directory` – By default, HP LTFS stores the pulled tickets in the `/var/logs/` directory, but this can be changed by the HP LTFS user. The TapeAssure LTFS service configuration must match the ticket store directory used by HP LTFS.

Check the TapeAssure LTFS service log for sent tickets

As tickets are sent to Command View TL, a log entry is made in the SA-TapeAssure_Service_log file, which is found in the logs folder in the install directory. The entry shows the ticket name, which includes the drive serial number and the time at which the ticket was created by HP LTFS.


root@sxe3204n:/usr/local/sa_tapeassure_agent/logs
[root@sxe3204n logs]# pwd
/usr/local/sa_tapeassure_agent/logs
[root@sxe3204n logs]# cat SA-TapeAssure_Service_log
Tue May 17 13:56:20 IST 2011:Pushed the file ltfs_20110429_150757_HU1042D7Km.ltd to http://192.0.2.20:8099
Tue May 17 13:56:20 IST 2011:Pushed the file ltfs_20111429_150757_HU1042D7Km.ltd to http://192.0.2.20:8099
Tue May 17 13:56:20 IST 2011:Pushed the file ltfs_20110429_150757_HU1042D7Km.ltd to http://192.0.2.20:8099
Tue May 17 13:56:20 IST 2011:Pushed the file ltfs_20111429_150757_HU1042D7Km.ltd to http://192.0.2.20:8099
[root@sxe3204n logs]#

Check that the TapeAssure service is running

Use the Sa_TapeAssure utility to verify that the HP TapeAssure LTFS service is running. `Sa_TapeAssure -d` should report that the service is `RUNNING`.

Check the TapeAssure LTFS service configuration

Key configuration parameters to check are:

- MANAGEMENT_STATION_IP – the IP address of the Command View TL management station
- MANAGEMENT_STATION_PORT – the port number of the Command View TL management station. Normally 8099 unless the port number has been changed using Command View TL.
- POLLING_INTERVAL – Verify that tickets are transported frequently enough to match your mount/unmount model. The default is that all outstanding tickets pulled by the HP LTFS driver will be sent every hour. Tickets are not removed from the HP LTFS ticket store directory when they are sent to Command View TL.
- HP LTFS TICKET STORE DIRECTORY – By default. HP LTFS writes the tickets to the `/var/logs/` directory on Linux and to the `$HOME/Library/Logs/LTFS/` directory on Mac. The directory can be changed by the HP LTFS user. The TapeAssure LTFS service configuration must match the ticket store directory used by HP LTFS.

Check the TapeAssure LTFS service log for sent tickets

When the TapeAssure LTFS service sends a ticket to Command View TL is makes a log entry in the `SA-TapeAssure_Service` log file, which is located in the installation directory. The entry includes the ticket name, which references the drive serial number and time when the ticket was created by HP LTFS.

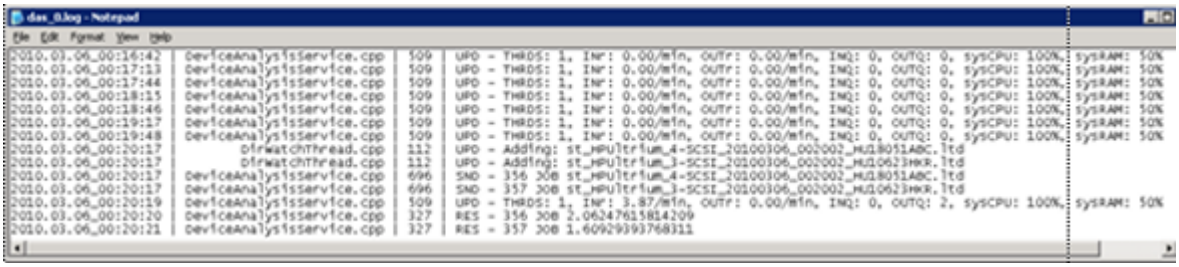
Check the Command View TL Device Analysis Service log for received tickets

As tickets are received by Command View TL, entries are made in the `das_[0..9].log` (Device Analysis Service) file which is found in the log folder in the Command View TL install directory:

```
C:\Program Files\Hewlett-Packard\Command View TL\log
```

There can be multiple log files starting with `das_0.log` and working up to das_9.log. This is done to limit disk usage and you must identify which of these is the most recent file (sort by Date Modified) to find the most recent log entries.

The log is very detailed and records a large number of low level steps, but if you can see the drive tickets referenced in that file, they are being received by Command View TL.


das_0.log - Notepad
File Edit Format View Help
2010.03.06_00:16:42 | DeviceAnalysisService.cpp | 509 | UPD - THRDS: 1, INF: 0.00/min, OUTF: 0.00/min, INQ: 0, OUTQ: 0, sysCPU: 100%, sysRAM: 50%
2010.03.06_00:17:13 | DeviceAnalysisService.cpp | 509 | UPD - THRDS: 1, INF: 0.00/min, OUTF: 0.00/min, INQ: 0, OUTQ: 0, sysCPU: 100%, sysRAM: 50%
2010.03.06_00:17:44 | DeviceAnalysisService.cpp | 509 | UPD - THRDS: 1, INF: 0.00/min, OUTF: 0.00/min, INQ: 0, OUTQ: 0, sysCPU: 100%, sysRAM: 50%
2010.03.06_00:18:15 | DeviceAnalysisService.cpp | 509 | UPD - THRDS: 1, INF: 0.00/min, OUTF: 0.00/min, INQ: 0, OUTQ: 0, sysCPU: 100%, sysRAM: 50%
2010.03.06_00:18:46 | DeviceAnalysisService.cpp | 509 | UPD - THRDS: 1, INF: 0.00/min, OUTF: 0.00/min, INQ: 0, OUTQ: 0, sysCPU: 100%, sysRAM: 50%
2010.03.06_00:19:17 | DeviceAnalysisService.cpp | 509 | UPD - THRDS: 1, INF: 0.00/min, OUTF: 0.00/min, INQ: 0, OUTQ: 0, sysCPU: 100%, sysRAM: 50%
2010.03.06_00:19:48 | DeviceAnalysisService.cpp | 509 | UPD - THRDS: 1, INF: 0.00/min, OUTF: 0.00/min, INQ: 0, OUTQ: 0, sysCPU: 100%, sysRAM: 50%
2010.03.06_00:20:17 | DirWatchThread.cpp | 112 | UPD - Adding: st_HPUltrium_4-SCSI_20100306_002002_HU18051ABC.ltd
2010.03.06_00:20:17 | DirWatchThread.cpp | 112 | UPD - Adding: st_HPUltrium_3-SCSI_20100306_002002_HU10623HKR.ltd
2010.03.06_00:20:17 | DeviceAnalysisService.cpp | 696 | SND - 356 308 st_HPUltrium_4-SCSI_20100306_002002_HU18051ABC.ltd
2010.03.06_00:20:17 | DeviceAnalysisService.cpp | 696 | SND - 357 308 st_HPUltrium_3-SCSI_20100306_002002_HU10623HKR.ltd
2010.03.06_00:20:19 | DeviceAnalysisService.cpp | 509 | UPD - THRDS: 1, INF: 3.87/min, OUTF: 0.00/min, INQ: 0, OUTQ: 2, sysCPU: 100%, sysRAM: 50%
2010.03.06_00:20:20 | DeviceAnalysisService.cpp | 327 | RES - 356 308 2.06247615814209
2010.03.06_00:20:21 | DeviceAnalysisService.cpp | 327 | RES - 357 308 1.60929393768311

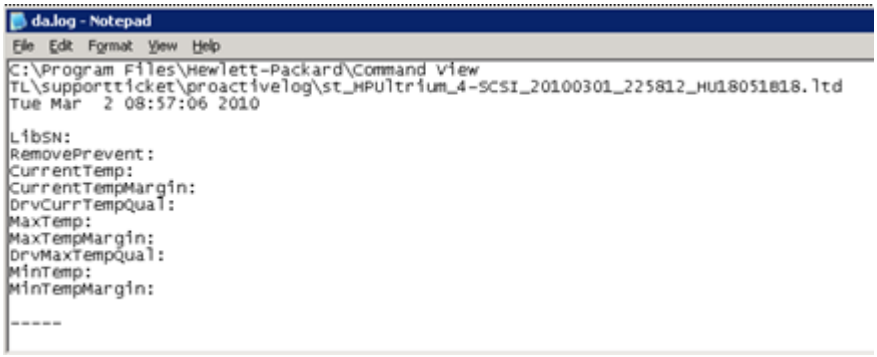
Check the Command View TL Device Analysis log for rejected tickets

Each received ticket is checked for completeness and for any corruption. Incomplete or corrupt tickets are rejected to avoid inconsistencies in the database.

If a ticket is rejected, it is recorded in the da.log file (Device Analysis) which is found in the log folder in the Command View TL install directory:

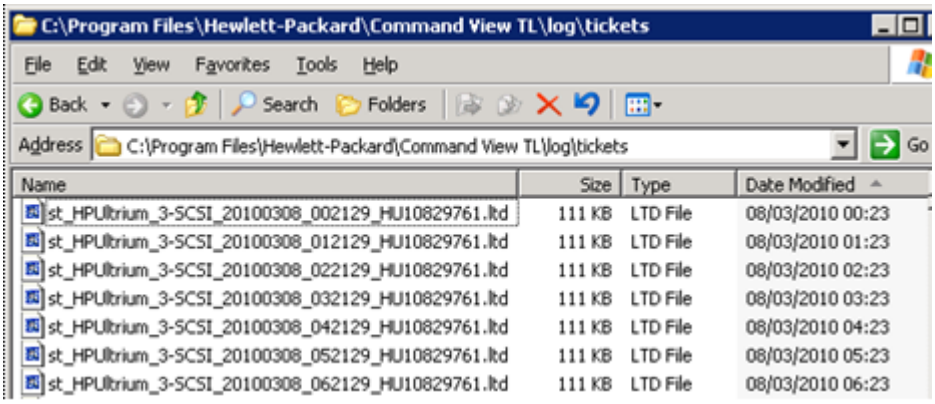
```
C:\Program Files\Hewlett-Packard\Command View TL\log
```

The fields that are incomplete or corrupt are listed in the log entry, which might help isolate the root cause of the problem.



If a ticket is rejected it is moved into a holding folder so that it can be viewed with L&TT and checked:

`C:\Program Files\Hewlett-Packard\Command View TL\log\tickets`


C:\Program Files\Hewlett-Packard\Command View TL\log\tickets
File Edit View Favorites Tools Help
Back Search Folders
Address C:\Program Files\Hewlett-Packard\Command View TL\log\tickets
Go
Name Size Type Date Modified
st_HPUltrium_3-SCSI_20100308_002129_HU10829761.ltd 111 KB LTD File 08/03/2010 00:23
st_HPUltrium_3-SCSI_20100308_012129_HU10829761.ltd 111 KB LTD File 08/03/2010 01:23
st_HPUltrium_3-SCSI_20100308_022129_HU10829761.ltd 111 KB LTD File 08/03/2010 02:23
st_HPUltrium_3-SCSI_20100308_032129_HU10829761.ltd 111 KB LTD File 08/03/2010 03:23
st_HPUltrium_3-SCSI_20100308_042129_HU10829761.ltd 111 KB LTD File 08/03/2010 04:23
st_HPUltrium_3-SCSI_20100308_052129_HU10829761.ltd 111 KB LTD File 08/03/2010 05:23
st_HPUltrium_3-SCSI_20100308_062129_HU10829761.ltd 111 KB LTD File 08/03/2010 06:23

Tickets in this directory are not transient so it is good practice to check this folder occasionally to see if there are any new tickets which may indicate issues in the ticket processing process that should be followed up by going back through the checks above.

6 About the Sa_TapeAssure utility

Synopsis

```
Sa_TapeAssure [-sScCvVzZtTdDrRhHh]
```

Description

Sa_TapeAssure is a utility to manage the following functions of the HP TapeAssure service:

- Configuration of the service
- Selective viewing and clearing of log/error files
- Starting and stopping the service
- Displaying the status of the service and statistical information

Options

-S, -s — Starts the HP TapeAssure Service.

The HP TapeAssure Service is started as a background process.

-T, -t — Stops the HP Tape Assure Service.

The HP TapeAssure Service process is killed with a signal from the SA_TapeAssure utility.

-C, -c — Configures the HP TapeAssure Service.

HP TapeAssure requires the following configurable entities to be set:

- CVTL Management Station IP — IP address of the Command View TL management station
- Port number — as configured in Command View TL
- Polling interval — time interval for checking for updated HP LTFS tickets, in minutes. Default is 60 minutes.
- Ticket store directory — name of the directory in which HP LTFS is configured to place tickets

-D, -d — Displays the status of HP TapeAssure service, along with statistics and configuration parameters:

1. Status indicating whether the service is `Running` or `Stopped`.
2. Command View TL management station IP address.
3. Command View TL management station port number.
4. Configured polling interval.
5. Comfigured ticket store directory name.

6. Number of tickets sent to the Command View TL management station since the last reset/installation of the HP TapeAssure LTFS service.
7. HP LTFS version information.
8. Total disk space occupied by the log file and error file, in MB.

-R, -r — Resets the counter for the number of tickets sent to the configured Command View TL management station..

This counter indicates the number of tickets sent since the last reset or installation of the HP TapeAssure LTFS service.

-Z, -z — Selectively clear the log or error file.

Use the interactive options to specify the file to be cleared.

-V, -v — Selectively view the log or error file.

Use the interactive options to specify the file to be viewed.

-H, -h — Displays the command line help information.

7 Support and other resources

Contacting HP

For worldwide technical support information, see the HP support website:

http://www.hp.com/support

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

http://www.hp.com/go/e-updates

After registering, you will receive e-mail notification of product enhancements, new driver versions, firmware updates, and other product resources.

Related information

The following documents and websites provide related information:

- *HP StorageWorks Interface Manager and Command View TL user guide*, available from http://www.hp.com/support/cvtl

HP websites

For additional information, see the following HP websites:

- http://www.hp.com
- http://www.hp.com/go/storage
- http://www.hp.com/service_locator
- http://www.hp.com/support/manuals
- http://www.hp.com/support/downloads

Typographic conventions

Table 1 Document conventions

Convention	Element
Blue text: Table 1	Cross-reference links and e-mail addresses
Blue, underlined text: http://www.hp.com	Website addresses
Bold text	• Keys that are pressed • Text typed into a GUI element, such as a box • GUI elements that are clicked or selected, such as menu and list items, buttons, tabs, and check boxes
Italic text	Text emphasis
`Monospace` text	• File and directory names • System output • Code • Commands, their arguments, and argument values
`Monospace, italic` text	• Code variables • Command variables
`Monospace, bold` text	Emphasized monospace text

⚠ WARNING!

Indicates that failure to follow directions could result in bodily harm or death.

△ CAUTION:

Indicates that failure to follow directions could result in damage to equipment or data.

IMPORTANT:

Provides clarifying information or specific instructions.

NOTE:

Provides additional information.

TIP:

Provides helpful hints and shortcuts.

HP product documentation survey

Are you the person who installs, maintains, or uses this HP storage product? If so, we would like to know more about your experience using the product documentation. If not, please pass this notice to the person who is responsible for these activities.

Our goal is to provide you with documentation that makes our storage hardware and software products easy to install, operate, and maintain. Your feedback is invaluable in letting us know how we can improve your experience with HP documentation.

Please take 10 minutes to visit the following web site and complete our online survey. This will provide us with valuable information that we will use to improve your experience in the future.

http://www.hp.com/support/storagedocsurvey

Thank you for your time and your investment in HP storage products.